

AMENDMENTS TO THE SPECIFICATION:

Page 1, before line 3, insert the following as separate paragraphs:

B1
--BACKGROUND

1. Field of the Invention--.

Page 1, before line 6, insert the following as a separate paragraph:

B2
--2. Description of Related Art--.

Please amend the paragraph beginning at page 1, line 6 as follows:

B3
Modern computer based record systems often contain large multi-dimensional databases which contain very large quantities of data. The utility of these systems often depends on the speed and accuracy with which selected data can be accessed in the database. Computer based data access systems capable of searching large databases and retrieving files and records according to one or more user defined parameters are known as are systems capable of searching and ~~analysing~~ analyzing data in such databases to provide statistical information about that data. In these systems data files or records are usually selected for retrieval or analysis on the basis of user defined logic parameters which relate to specific data fields in the data files or records being searched. User defined logic statements are also used to select data files or records in a similar way, that is to say, statements consisting of two or more user defined logic parameters in

B3 combination with a logic operand. In this way the data files or records are selected on a binary yes or no basis.

Please amend the paragraph beginning at page 1, line 19 as follows:

B4 The ability to identify patterns in large quantities of data can be of significant commercial benefit, particularly to a commercial ~~organisation~~ organization that generates a large quantity of customer related data on a regular basis. For example, the call database of a large telecommunications company will contain valuable hidden information regarding groups of customers who have similar usage patterns etc. By identifying customers according to such patterns valuable customer information can be obtained and customer profiles developed.

Page 2, before line 12, insert the following as a separate paragraph:

B5 --SUMMARY--.

Please amend the paragraph beginning at page 3, line 1 as follows:

B6 This allows each of the data files to be represented visually as an element moving on the display means. Patterns in the data are readily ~~recognisable~~ recognizable since each element moves in accordance with the relevance of the sort statements to the data file it represents. In this way differences between respective data files can be observed on the display means as relative movements between the respective elements. Thus,

36 hidden patterns in the data are easily identified by observing groups of elements moving in a similar way on the display means. The selecting means allows these groups of elements to be selected so that the respective data files can be accessed and analysedanalyzed.

Please amend the paragraph beginning at page 3, line 22 as follows:

37 In preferred embodiments, the step of determining the value of the relevance parameter for each data file, for each sort statement, is ~~normalised~~normalized. This is done by identifying the most relevant data file for each sort statement, assigning it a maximum relevance parameter value such as 100% and determining respective ~~normalised~~normalized values for the rest of the data files based on said maximum relevance parameter value. This enables the respective movements of the elements to be readily determined.

Please amend the paragraph beginning at page 3, line 29 as follows:

38 The step of moving the elements may comprise the step of determining a movement vector for each element based on the magnitude of the ~~normalised~~normalized values of the respective data file and the direction of relevant sort parameter sites relative to the element. In this way the position of the sort statement sites affects the movement of the elements. Accordingly, the sort statement sites can be positioned to investigate any hidden pattern in the data records.

Please amend the paragraph beginning at page 4, line 3 as follows:

39 | Preferably, the step of determining a movement vector for each element comprises the step of determining a component movement vector for the element in respect of each sort statement based on the magnitude of the respective ~~normalised~~normalized value of the respective data file for the sort statement and the direction of the respective sort statement site to that element, and summing the component movement vectors.

Please amend the paragraph beginning at page 5, line 10 as follows:

310 | Conveniently, the method further comprises the step of storing selected data files. This allows the selected data records to be ~~analysed~~analyzed further according to further sort statements and parameters.

Please amend the paragraph beginning at page 5, line 16 as follows:

311 | Preferably, the method further comprises the step of pre-formatting the data files to be sorted. This provides for a faster method and further ~~optimises~~optimizes the above mentioned advantages.

Page 6, before line 5, insert the following as a separate paragraph:

312 | --BRIEF DESCRIPTION OF THE DRAWINGS--.

Page 6, before line 19, insert the following as a separate paragraph:

B13 --DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS--.

Please amend the paragraph beginning at page 6, line 19 as follows:

B14 With reference to Figures 1 and 2, a system embodying the present invention comprises a client-server communication network arrangement 150. A server 152 is connected to a plurality of client terminals 156a-c in the network by means of a plurality of data links 158a-c. The client terminals are conventional computer systems provided with display means in the form of a screen 160. The client terminals are personal computers (PCs) capable of being networked together in a client-server environment. The server 152 has a datalink 162 to a main network connection 164 which is linked to a read only database 166. In this embodiment the database 166 is a call database of a large telecommunications company and contains all the call records of a group of customers for a given accounting period. A further database 168 comprises data from the database 166 which has been restructured by the server 152, or other processor means, into a series of customer related files for use in the method of the present invention.

Please amend the paragraph beginning at page 7, line 3 as follows:

B15 The data held in database 172 comprises data relating to the user interface used for presenting information to the user on the display means of the client terminals 156a-c. This data comprises the definition of the screen layout, data relating to the presentation of

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user options and data relating to all user interface functions including data identification, selection and access for example. The data held in the database 174 comprises data relating to user selection options including the sort parameters available to be used in data sorting and selection, scaling factors and the like for use in a visual presentation and data filter parameters available to reduce the amount of data prior to sorting, for example. The database 176 stores data that has either been defined by the user such as sort statements comprising one or more of the parameters in database 174, or data that the user has selected for analysis, for example.

Please amend the paragraph beginning at page 7, line 15 as follows:

316
The processors 170 comprise a first processor 180 which is capable of reading data from database 166 and restructuring the data into a series of customer files for subsequent use. The restructured data is stored in the database 168 by the processor 180. A second processor 182 provides a data filter. Data from the database 168 is filtered in processor 182 according to user defined filter parameters selected by the user of the system. The user defined filter parameters are stored in the database 176 following user selection and accessed by the processor 182. The filter data is stored in the database 168 by the processor 182. A third processor 184 in the form of a sort statement generator is provided for generating one or more sort statements, that is a sort statement comprising one or more sort parameters selected by the user from the sort parameter options in the database 174. The processor 184 stores the user defined sort statements in the database

176. A fourth processor 186 is provided for determining the value of a relevance parameter for each customer file in respect of each sort statement based on the relevance of the sort parameter to the customer file. In this respect processor 186 is capable of reading the post-filtered customer files from database 168 and storing the relevance values to the database 176. A fifth processor 188 comprises a position generator for establishing a position on the display means to be associated with each sort statement. The fifth processor receives data from the database 174 regarding the options the user may use in defining the positions. These options are available to the user through the user interface. The user also has the option of defining the position manually in which case selection of the positions is controlled by the processor 188. A sixth processor 190 provides a visual signal processor for representing the customer data files as elements on one or more pixels on the display means of the user's client terminals 156a-c. The sixth processor is capable of receiving data from the fourth and fifth processors and moving the elements by a number of pixels towards one or more of the sites in order to visually represent the data files being sorted. The visual signal processor 190 has a motion pause function for pausing the motion of the elements on the display means and a zoom function for zooming in on a particular area of the display means. A seventh processor 192 comprises a data selector for user defined selection of customer data files according to the position of the elements on the display means. The data selector allows the user to select one or more records at a time for immediate access of the data or for storage in the

316 database 176 for subsequent access. An eight processor 194 provides a data access processor for accessing the data selected by the user.

Please amend the paragraph beginning at page 10, line 15 as follows:

317 The above process is repeated for each sort parameter statement for each customer file. Once all the files have been compared the value of a relevance parameter is determined for each data file in respect of each sort statement, that is the files are assigned values representing the relevance of the sort statements to the respective the files. If a sort statement comprises only sort parameters which relate to static data the value of the relevance parameter for the sort statement will be either 100% or 0%, that is yes or no. For example, if a sort statement were framed to ask the question "does the customer have an ISDN connection" the outcome would be either yes or no. If on the other hand the sort statement comprises sort parameters which relate to transactional data the value of the relevance parameter for the sort statement will have a value between 0% and 100%. The process of determining the value of the relevance parameter for a sort statement comprising transactional data sort parameters to a customer file involves the step of identifying the most relevant file for that sort statement, that is the file having the most records relevant to that statement, and then determining a ~~normalised~~ normalized percentage value based on the number of records counted for the file and the number of records counted for the most relevant file. For example, if a sort statement is framed to ask the question "total number of calls under 3 minutes" and a file comprising 66 calls is

317 found to be the most relevant a file comprising 33 calls will have a relevance value of 50%. The most relevant file will have a value of 100% indicating that it is very strongly associated with the sort statement. Thus, all the files are given a percentage value corresponding to how strongly associated they are with each of the sort statements defined in step 16. This data is stored for further analysis in step 22. Alternatively, the step of determining the value of the relevance parameter for a sort statement in respect of each file involves the step of determining a value based on the number of transactional records counted for the file and the total number of transactional records in the file. For example, if the sort statement is framed to ask the question "total number of calls under 3 minutes", a file comprising 33 calls of less than 3 minutes out of a total of 100 calls will have a relevance value of 33%.

Please amend the paragraph beginning at page 11, line 11 as follows:

318 Patterns in the data are investigated by the user according to the method steps that follow. In step 24 all or selected ones of the sort statements are visually represented on the display means. As shown in Figure 4, the sort parameters are allocated a respective site 100 (sites 100a-100f) on the display means corresponding to a point on the circumference of a circle 102. The positions of the respective sort statement sites are determined either interactively by the user or automatically by a position generator in the system, but in either case the positions are capable of being moved around the circumference by the user if desired. The sites are distinguished from each other by the

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B18 use of different colours or shapes etc, which also relate the sites to their respective sort statements by means of a legend displayed on the display means.

Please amend the paragraph beginning at page 17, line 1 as follows:

B19 | ~~CLAIMS:~~ What is Claimed is:
